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Abstract:

As part of its 5-year study, the Strategic Exploration of Exoplanets and Disk Systems (SEEDS) has already observed a number of YSOs with circumstellar disks, including 13 0.5-8 Myr old A-M stars with indications that they host wide gaps or central cavities in their circumstellar disks in millimeter or far-IR observations, or from deficits in warm dust thermal emission. For 8 of the disks, the 0.15" inner working angle of HiCIAO+AO188 samples material in the millimeter or mid-IR identified cavity. In one case we report detection of a previously unrecognized wide gap. For the remaining 4 stars, the SEEDS data sample the outer disk: in 3 cases, we present the first NIR imagery of the disks.

The data for the youngest sample members (<1-2 Myr) closely resemble coeval primordial disks. After ~3 Myr, the transitional disks show a wealth of structure including spiral features, rings, divots, and in some cases, largely cleared gaps in the disks which are not seen in coeval primordial disks. Some of these structural features are predicted consequences of Jovian-mass planets having formed in the disk, while others are novel features. We discuss the implications for massive planet formation timescales and mechanisms.